SONY

ELECTRONIC VIEWFINDER

BVF-10
BVF-10CE

MAINTENANCE MANUAL
1st Edition
Serial No. 90001 and Higher (BVF-10)
Serial No. 90001 and Higher (BVF-10CE)

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理など行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠ AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

X-RAY RADIATION WARNING

Be sure that parts replacement in the high voltage block and adjustments made to the high voltage circuits are carried out precisely in accordance with the procedures given in this manual.

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Section 1
Service Overview

1-1. Notes on Repair Parts

1. WARNING

Safety Related Components Warning

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.

Parts list has the present standardized repair parts.

3. Stock of Parts

Parts marked with “o” at SP(Supply Code) column of the spare parts list may be not stocked. Therefore, the delivery date will be delayed.

4. Units Representation

The following represented units are changed or omitted in writing.

Units		Representation
Capacitance	μF	uF
Inductance	μH	uH
Resistance	Ω	Abbreviation

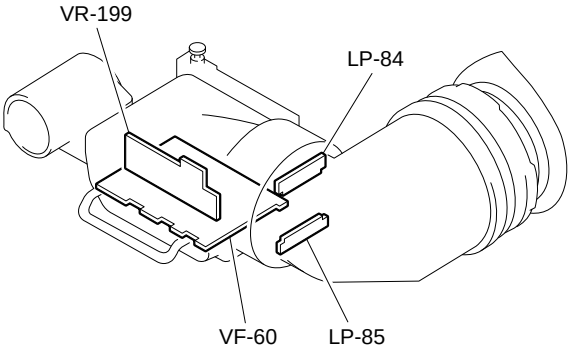
5. Destination Representation

The part indicated “For UCJ/CE” in the spare parts list is used in the unit written below.

For UCJ : The part is used in a unit for Japan, U.S.A. and Canada.

For CE : The part is used in a unit for regions except the above countries.

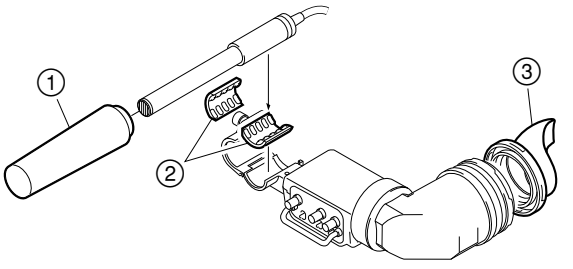
1-2. Location of Printed Circuit Boards



1-3. Periodic Replacement Part

Parts listed below are periodic replacement parts. They are subject to cracks with the lapse of time. Check sometimes by visual, and replace as necessary.

No.	Description	Sony P/N
①	WIND SCREEN	3-708-875-0X
②	MIC CUSHION, RUBBER	3-692-138-0X
③	EYE CUP	3-723-079-0X



1-4. Cleaning

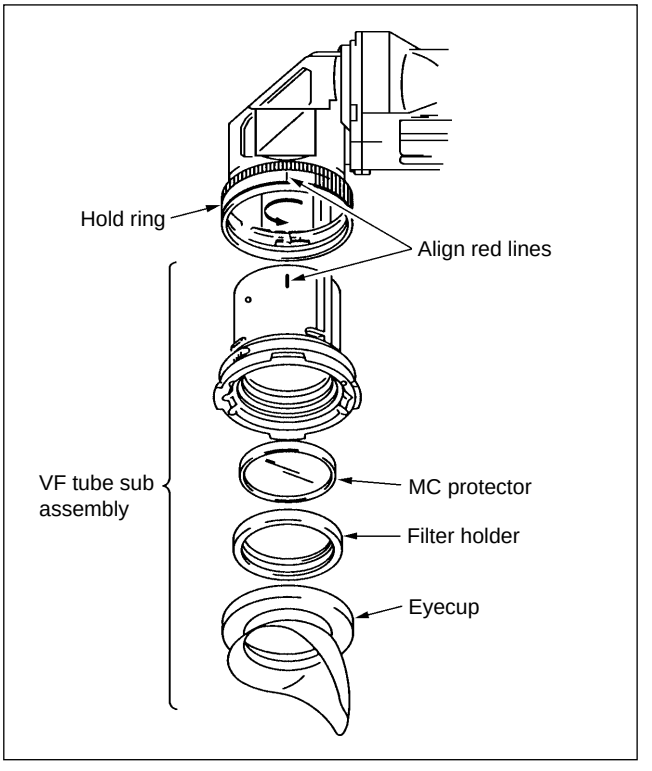
1-4-1. Cleaning of Viewfinder

By extracting VF tube sub assy, lens and MC protector can be easily cleaned. And also dust on the CRT surface or mirror can be easily cleaned off.

1. Turn the hold ring to the left and extract the VF tube sub assy.
2. Detach the eyecup.
3. Remove the MC protector with a commercially available camera lens cleaner. Blow off dust with a blower carefully so as not to flaw the mirror.
5. After the cleaning is completed, install by reversing the preceding steps. Align red lines of the VF tube and VF tube sub assy when inserting, and turn the hold ring to the right until it locks.

Notes

- Do not use any type of solvent, such as alcohol, benzine or thinner to remove stains.
- Be sure to attach the eyecup to the VF, or the MC protector may come off.
- To protect the viewfinder lens from drops, put the MC protector in the filter holder and attach the eyecup securely.



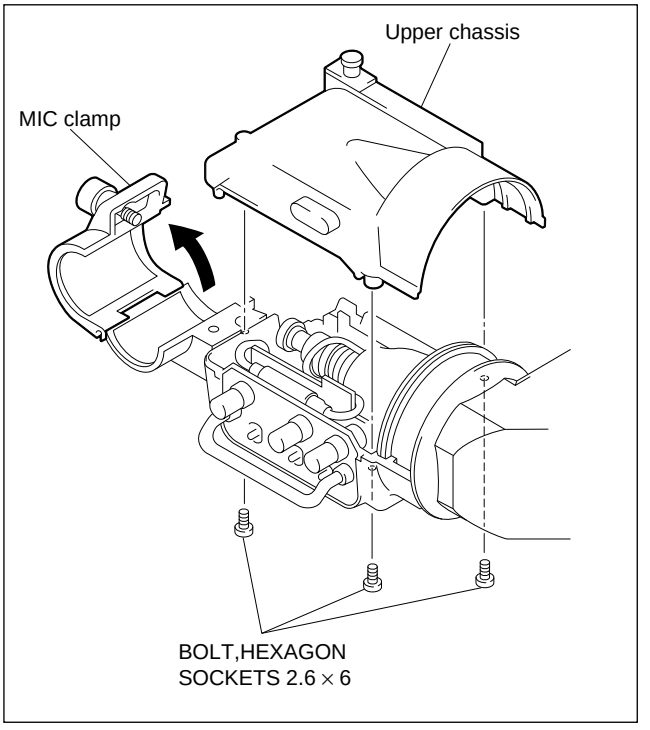
1-4-2. Cares After Using at Special Environment

It is recommended to check the following items after gathering the news at seaside, dust area or spa.

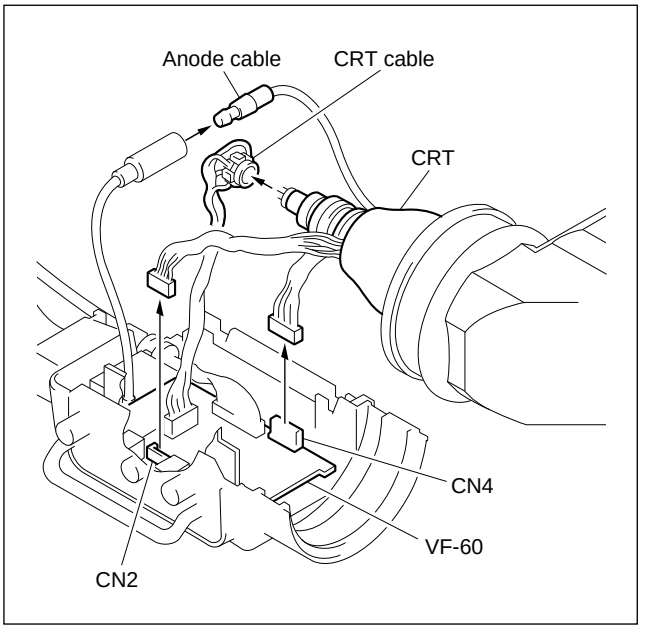
1. Clean off sand and other dust in the unit carefully.
2. Do not allow salt in seawater or sulfur in spa to contact a not-painted surface of the cabinet. They may cause to corrode. Clean with alcohol immediately if contacted.
3. Clean the connection surface of connectors.
4. Carry out the common operation check and check that the unit has not an abnormal sound or operation.

1-5. Replacement of CRT

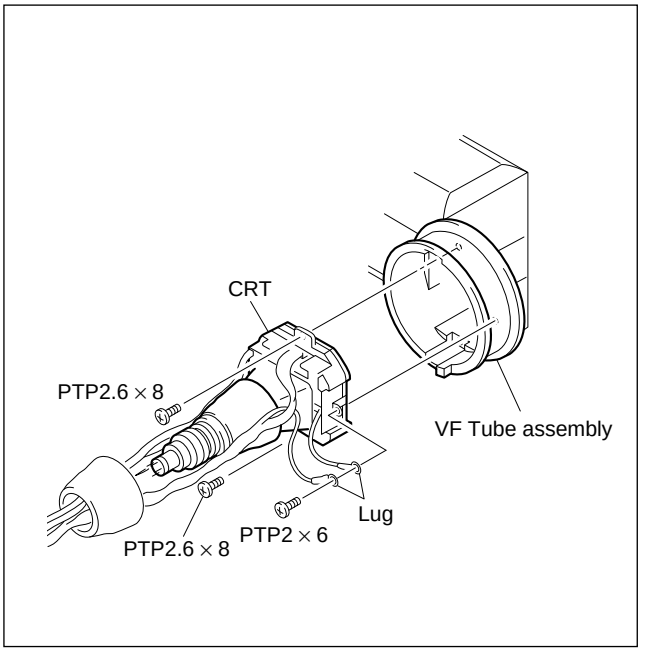
1. Loosen the screw of the MIC clamp and open the MIC clamp.
2. Remove the three screws and remove the upper chassis.



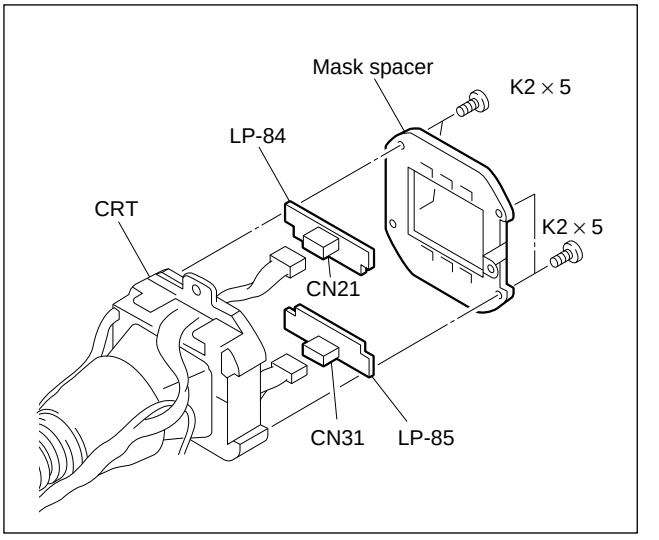
3. Disconnect the three connectors CN2, CN4 and anode cable of the VF-60 board.
4. Remove the CRT socket from the CRT.



5. Remove the three screws and remove the CRT from the VF tube assembly.
6. Remove the CRT tube from the CRT.



7. Remove the four screws and remove the mask spacer.
8. Disconnect the connectors CN21 on LP-84 board and CN31 on LP-85 board.



9. Install a new CRT in the reverse procedures of removal.

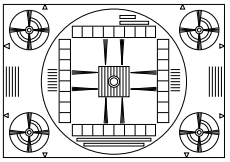
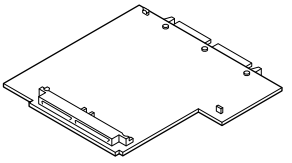
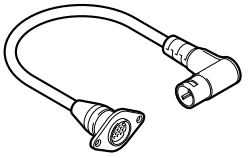
Note

When installing the upper chassis, take care not to clamp the harness between upper and lower chassis.

Section 2
Electrical Alignment

2-1. Preparation

2-1-1. Equipment Required

Resolution Chart	Extension board EX-464 (option)
Sony P/N: J-6026-100-A 	**Sony P/N: J-6395-040-A** For BVP-550 plug-in boards 
VF extension harness	
Sony P/N: J-6395-050-A 	

Equipment

- Digital voltmeter
- Oscilloscope (band width: 150 MHz or more)
- Waveform monitor
- B/W monitor (Horizontal resolution: 700 lines or more)
- Frequency counter

Peripheral Equipment

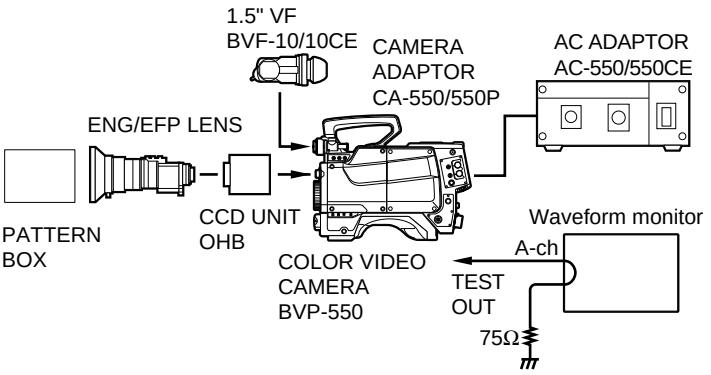
- Color video camera BVP-550
- CCD unit OHB-450/550 series
- Camera adaptor CA-550/550P
- AC adaptor AC-550/550CE

2-1-2. Notes on Adjustment

When performing the adjustment, read throughly the following comments.

1. The calibration of all measuring equipment should be completed.
2. Camera, camera adaptor and CCD unit alignment should be also completed.
3. “2-1-4. Initial Setting” should be completed.
4. Turn off the power before extending the plug-in board using the extension board.

2-1-3. Connections



2-1-4. Initial Setting

Setup menu:

- Execute the Scene File Standard.
  MENU : Paint
  PAGE : Scene File (P8)
  ITEM : Standard
  Press the MENU SEL switch (on the front panel) to execute the Scene File Standard.

- Set each item through the setup menu as follows. (Refer to the Operation Manual to operate the setup menu.)
  MENU : Operation
  PAGE : Gain Sw (?3)
  ITEM : Low → 0 dB
  ITEM : Middle → 9 dB
  ITEM : High → 18 dB

Side Panel:

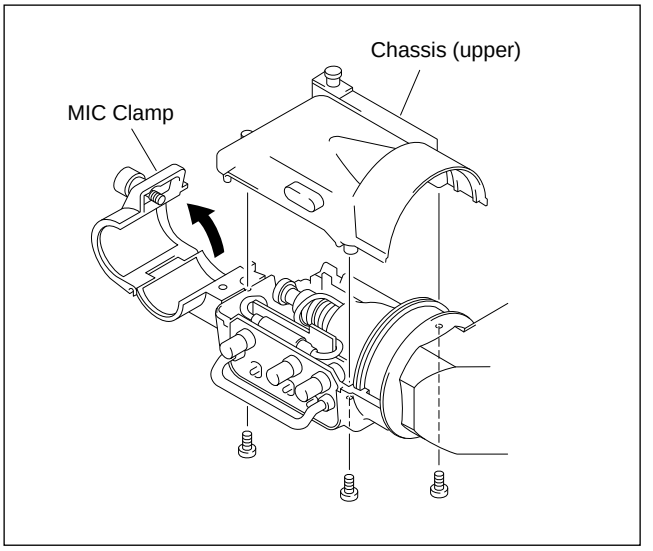
VTR SAVE/STBY switch → STBY
GAIN switch → L (0 dB)
OUTPUT/DCC switch → CAM/OFF
WHITE BAL switch → PRST

Front Panel:

SHUTTER switch → OFF

2-1-5. Extending Viewfinder

1. Turn off the main power switch (on the camera) before performing adjustment.
2. Remove the viewfinder from the camera, then remove the chassis (upper).



3. Connect the viewfinder to the camera using the VF extension harness (J-6395-050-A).
4. Turn on the main power switch.

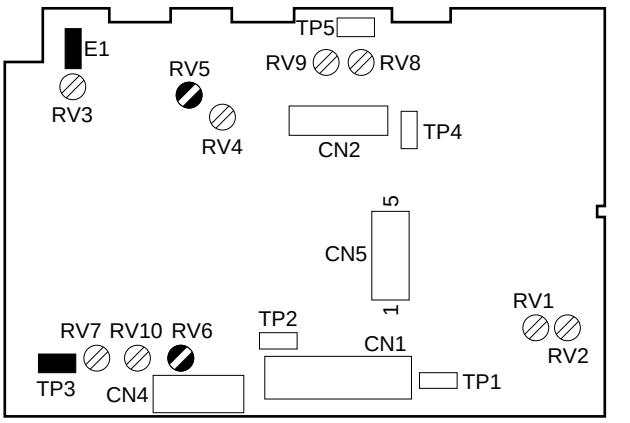
2-2. Vertical Hold Adjustment

Equipment : Frequency counter

Preparations:
Extend the IF-510 board of BVP-550 with EX-464 extension board.
Short between pins 45 and 92 on the EX-464 board using a shorting clip.
Set ⊘RV6 (V SIZE)/VF-60 board to the mechanical center position.
(When ⊘RV6 is marked, it should not be turned.)

Test point : TP3/VF-60
GND : E1/VF-60
Adjustment point : ⊘RV5 (V HOLD)/VF-60
Specifications : 48.0 ±0.5 Hz (for NTSC)
38.0 ±0.5 Hz (for PAL)

After adjustment is completed, disconnect the shorting clip on the EX-464.
Connect the IF-510 board to the camera.



VF-60 BOARD (A SIDE)

2-3. Horizontal Hold Adjustment

Equipment : Frequency counter

Preparations:
Extend the IF-510 board of BVP-550 with EX-464 extension board.
Short between pins 45 and 92 on the EX-464 board using a shorting clip.
Set ⊘RV6 (V SIZE)/VF-60 board to the mechanical center position.
(When ⊘RV6 is marked, it should not be turned.)

Test point : TP1/VF-60
GND : E1/VF-60
Adjustment point : ⊘RV3 (H HOLD)/VF-60
Specifications : 15.73 ±0.05 kHz (for NTSC)
15.63 ±0.05 kHz (for PAL)

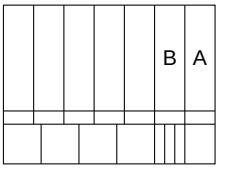
After adjustment is completed, disconnect the shorting clip on the EX-464.
Connect the IF-510 board to the camera.

2-4. Bright Set Adjustment

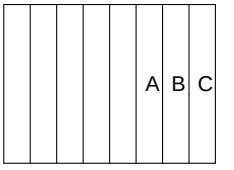
Preparations:
OUTPUT/DCC switch (on the camera side panel)
→BARS/OFF
BRIGHT control →Fully counterclockwise
CONTRAST control →Fully clockwise

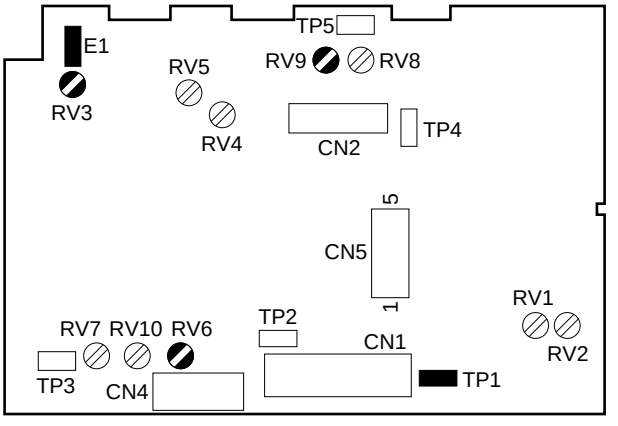
Adjustment point : ⊘RV9 (SUB BRIGHT)/VF-60
Specifications

For NTSC model
Specs.: Adjust ⊘RV9/VF-60 so that portions A and B on the viewfinder screen can be barely discriminated.



For PAL model
Specs.: Adjust ⊘RV9/VF-60 so that portions A and B on the viewfinder screen can be barely discriminated, and portions B and C cannot be discriminated.





VF-60 BOARD (A SIDE)

2-5. Focus Adjustment

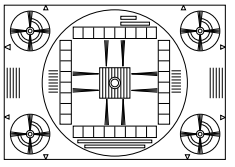
Note:

- This adjustment, “2-6. Heater Voltage Adjustment” and “2-7. Picture Frame Adjustment” affect each other. Therefore, repeat these three adjustments until these specifications are satisfied.

Equipment : Waveform monitor
Object : Resolution chart

Preparations:

Shoot the resolution chart so that the chart frame is aligned with the underscanned monitor frame.
Adjust the iris of the lens so that the output level at TEST OUT connector /BVP-550 satisfies the level A.
A = 70 ±2 IRE (for NTSC)
A = 490 ±14 mV (for PAL)



(Viewfinder Screen)

BRIGHT control → mechanical center
CONTRAST control → mechanical center

Adjustment point : ⊘RV2 (ANODE SET)/VF-60
Specifications : Turn ⊘RV2 fully counterclockwise, and slowly turn it clockwise to adjust the best focus position.

Note:

After adjustment is completed, confirm that the focus operation can be performed irrespective of its BRIGHT and CONTRAST controls setting.

2-6. Heater Voltage Adjustment

Note:

- This adjustment, “2-5. Focus Adjustment” and “2-7. Picture Frame Adjustment” affect each other. Therefore, repeat these three adjustments until these specifications are satisfied.

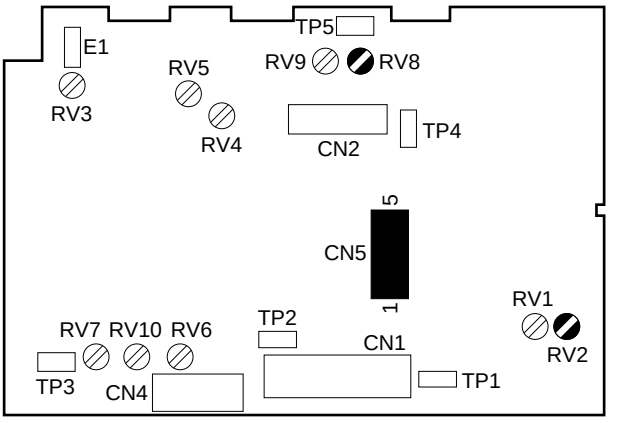
Equipment : Digital voltmeter

Preparations:

BRIGHT control → mechanical center
CONTRAST control → mechanical center
PEAKING control → mechanical center

Iris of the lens : Close

Test points : CN5-4pin/VF-60
CN5-5pin/VF-60
Adjustment point : ⊘RV8 (HEATER)/VF-60
Specifications : 700 ±10 mV dc



VF-60 BOARD (A SIDE)

2-7. Picture Frame Adjustment

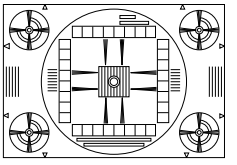
Note:

- This adjustment, “2-5. Focus Adjustment” and “2-6. Heater Voltage Adjustment” affect each other. Therefore, repeat these three adjustments until these specifications are satisfied.

Equipment : Oscilloscope
Object : Resolution chart

Preparations:

Shoot the resolution chart so that the chart frame is aligned with the underscanned monitor frame.
Adjust the iris of the lens so that the output level at TEST OUT connector /BVP-550 satisfies the level A.
A = 70 ±2 IRE (for NTSC)
A = 490 ±14 mV (for PAL)

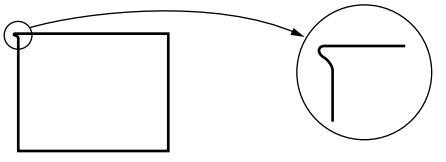


(Viewfinder Screen)

BRIGHT control → mechanical center
CONTRAST control → mechanical center
PEAKING control → mechanical center

Adjustment procedures:

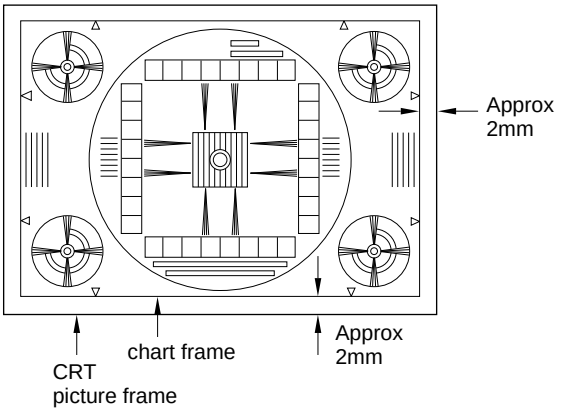
1. **Adjustment point** : ⊘RV3 (H HOLD)/VF-60
   Specifications : If the upper left corner of the picture is distorted, makes right angle.



(Viewfinder Screen)

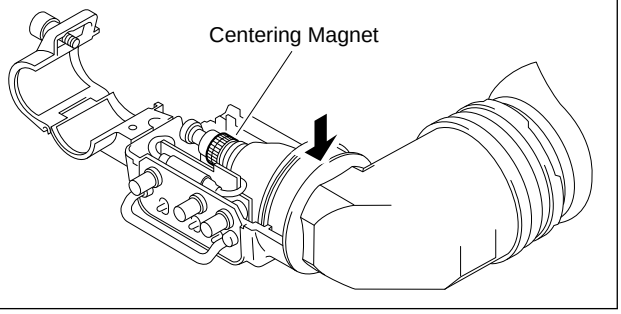
2. **Adjustment point** : ⊘RV7 (V LIN)/VF-60
   Specifications : Minimize the distortion of the four circles at the corners of the resolution chart.

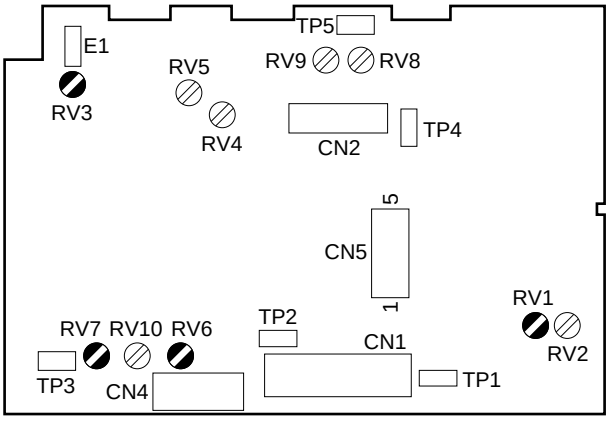
3. **Adjustment point** : ⊘RV1 (H SIZE)/VF-60
   ⊘RV6 (V SIZE)/VF-60
   ⊘Centering magnet
   Specifications : Adjust ⊘RV1 (H SIZE) and ⊘RV6 (V SIZE) so that the position of the resolution chart are as shown below.
   Turn the centering magnet only when the left and lower corners cannot be adjusted.



(Viewfinder Screen)

4. Place the VF tube to the lower chassis as shown below, and confirm that the picture is in the center of the viewfinder in the normal installing position.

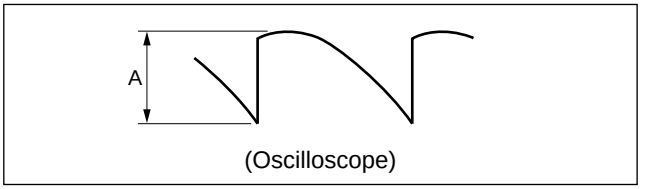




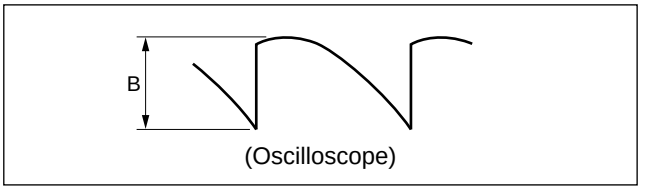
VF-60 BOARD (A SIDE)

5. **Test point** : TP3/VF-60
   GND : E1/VF-60

Measure and memorize the level A shown in the figure below.

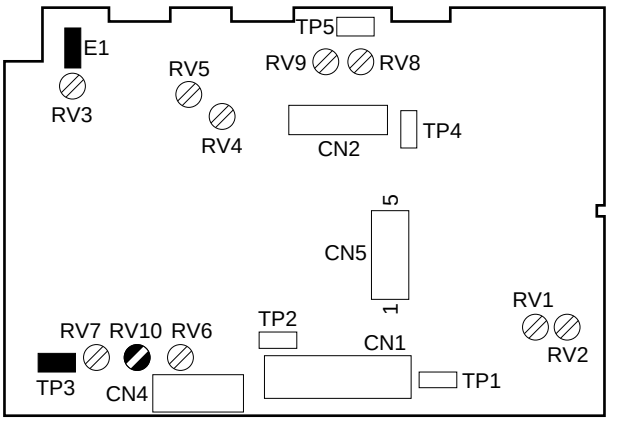


6. Extend the AT-95 board of BVP-550 using EX-464 extension board, and short between pins 76 and 100 on the EX-464 board using a shorting clip. (Turn into 16:9 mode.)
7. **Test point** : TP3/VF-60
   GND : E1/VF-60
   Adjustment point : RV10 (V SIZE (WIDE))/VF-60
   Specifications : Measure the level B, and adjust the ratio to A : B = 4 : 3.



Notes:

- When the centering magnet is turned, paint-lock it again.
- After these adjustments are completed, disconnect the shorting clip, and connect the AT-95 board to the camera.



VF-60 BOARD (A SIDE)

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Section 3
Spare Parts

3-1. Notes on Repair Parts

1. WARNING Safety Related Components Warning

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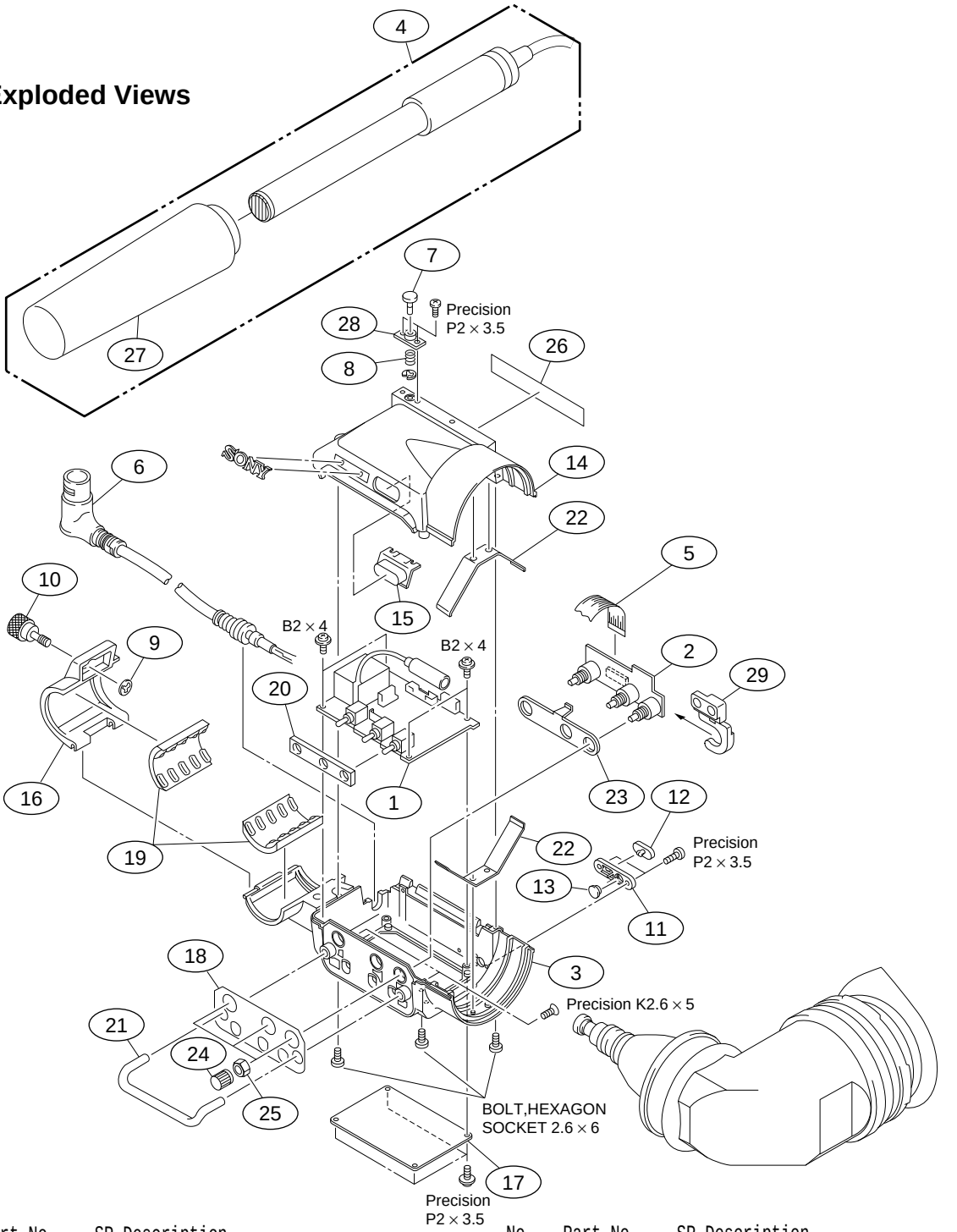
Capacitance	μF	uF
Inductance	μH	uH
Resistance	Ω	Abbreviation

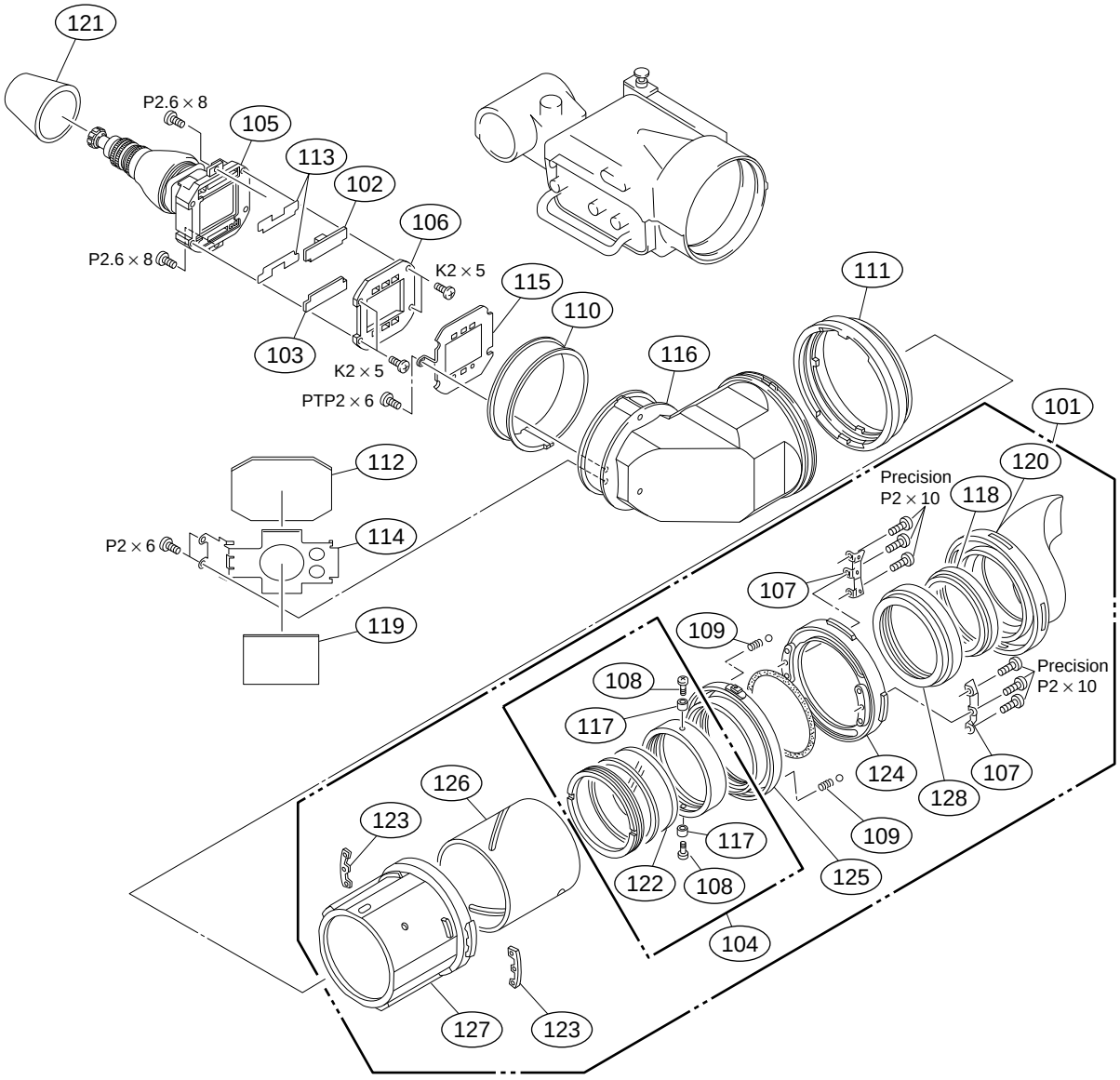
5. Destination Representation

The part indicated “For UCJ/CE” in the spare parts list is used in the unit written below.
For UCJ : The part is used in a unit for Japan, U.S.A. and Canada.
For CE : The part is used in a unit for regions except the above countries.

3-2. Exploded Views



No.	Part No.	SP	Description
1	A-8269-387-A	o	MOUNTED CIRCUIT BOARD, VF-60
2	A-8269-388-A	o	MOUNTED CIRCUIT BOARD, VR-199
3	X-3678-435-1	o	CHASSIS,BOTTOM ASSY
4	1-542-232-12	o	MICROPHONE (SUPPLIED ACCESSORY)
5	1-775-771-11	o	FLEXIBLE CARD WIRE (14 CORE)
6	1-777-028-21	s	CORD, CONNECTION (VF)
7	2-277-457-00	s	KNOB, STOPPER
8	2-277-466-01	s	SPRING, COMPRESSION
9	3-165-904-01	s	WASHER, SCREW STOPPER
10	3-657-657-00	s	SCREW (M5)
11	3-679-693-01	o	BASE,SLIDE
12	3-679-694-01	o	COVER,SLIDE
13	3-679-695-01	o	COVER,TALLY
14	3-692-131-01	o	CHASSIS,UPPER
15	3-692-132-01	o	COVER,TALLY
16	3-692-134-01	o	MIC CLAMP
17	3-692-135-01	o	LID,COVER
18	3-692-137-01	o	LABEL,VF
19	3-692-138-01	s	MIC CUSHION,RUBBER
20	3-692-145-01	o	CUSSHION,DRROP PROTECCTION
21	3-692-147-01	o	GUARD BAR
22	3-692-148-02	o	LEAF SPRING
23	3-692-151-01	o	PLATE, GROUND
24	3-692-154-01	s	KNOB, VF
25	3-693-327-01	s	NUT, M6
26	3-693-978-01	o	SHEET, LUBRICATION
27	3-708-875-01	s	SCREEN, WIND (SUPPLIED ACCESSORY)
28	3-710-008-02	s	HOUSING, STOPPER
29	3-695-875-01	s	PROTECTOR, CABLE



No.	Part No.	SP	Description
101	A-7612-389-B	s	TUBE SUB ASSY, VF
102	A-8269-389-A	o	MOUNTED CIRCUIT BOARD, LP-84
103	A-8269-390-A	o	MOUNTED CIRCUIT BOARD, LP-85
104	X-3722-436-1	o	LENS ASSY
105	⚠ 1-251-386-11	s	1.5" CRT ASSY
106	3-176-022-03	o	SPACER (B), MASK
107	3-176-414-01	o	RETAINER, RING
108	3-335-207-01	s	SHAFT, MOTOR
109	3-573-150-00	o	SPRING, COMPRESSION
110	3-692-133-01	o	RING,VF
111	3-692-136-01	o	FIXED RING
112	3-692-139-01	o	MIRROR(2)
113	3-692-144-01	o	SPACER,LP
114	3-692-146-01	o	HOLDER,MIRROR(2)
115	3-692-155-01	o	PLATE,DISPLAY
116	3-692-166-01	o	VF TUBU(3)
117	3-722-485-01	o	ROLLER, SLIDE
118	3-723-069-02	o	PROTECTOR, MC
119	3-723-073-01	o	CUSHION, MIRROR
120	3-723-079-01	s	EYE CUP
121	3-725-220-02	o	TUBE (A), CRT
122	3-725-276-01	s	LUPE, VF
123	3-742-038-01	o	NUT (2), PLATE
124	3-742-052-03	o	HOLDER, EYE CUP
125	3-742-053-02	o	RING
126	3-742-054-01	o	TUBE
127	3-742-060-01	o	HOLDER, RING
128	3-742-075-01	o	HOLDER, FILTER
	7-623-505-01	s	LUG, 2
	7-624-200-01	s	NUT, PUSH 1.5
	7-627-454-38	s	SCREW, PRECISION +K 2.6X5
	7-627-553-78	s	SCREW,PRECISION +P 2X10
	7-627-554-18	s	SCREW,PRECISION +P 2X3.5 TYPE1
	7-671-158-01	s	BALL, STAINLESS (2.5 DIA)
	7-682-545-04	s	SCREW +B 3X4
	7-683-412-05	s	BOLT,HEXAGON SOCKET 2.6X6
	7-685-104-19	s	SCREW +P 2X6 TYPE2 NON-SLIT
	7-685-134-19	s	SCREW +P 2.6X8 TYPE2 NON-SLIT

3-3. Electrical Parts List

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LP-84 BOARD
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Ref. No.
or Q'ty  Part No.    SP Description

1pc      A-8269-389-A o MOUNTED CIRCUIT BOARD, LP-84

CN21     1-566-759-11 o PIN, CONNECTOR (PC BOARD) 4P

D1       8-719-026-39 s DIODE CL-150UR-CD-T
D2       8-719-026-39 s DIODE CL-150UR-CD-T
D3       8-719-987-43 s DIODE CL-150PG-CD
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LP-85 BOARD
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Ref. No.
or Q'ty  Part No.    SP Description

1pc      A-8269-390-A o MOUNTED CIRCUIT BOARD, LP-85

CN31     1-566-759-11 o PIN, CONNECTOR (PC BOARD) 4P

D1       8-719-026-16 s DIODE CL-150D-CD-T
D2       8-719-026-39 s DIODE CL-150UR-CD-T
D3       8-719-026-16 s DIODE CL-150D-CD-T
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VF-60 BOARD
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Ref. No.
or Q'ty  Part No.    SP Description

1pc      A-8269-387-A o MOUNTED CIRCUIT BOARD, VF-60

C1       1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V
C2       1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V
C3       1-164-232-11 s CERAMIC, CHIP 0.01uF 10% 50V
C4       1-104-911-11 s TANTALUM, CHIP 33uF 20% 10V
C5       1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V

C6       1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V
C7       1-163-249-11 s CERAMIC, CHIP 82PF 5% 50V
C8       1-107-686-11 s CHIP, TANTALUM 4.7uF 20% 16V
C9       1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V
C10      1-163-038-00 s CHIP, CERAMIC 0.1uF 25V

C11    ⚠ 1-136-480-11 s FILM 0.0015MF 5% 100
C12      1-136-683-11 s FILM 0.0056uF 5% 100V
C13      1-163-037-11 s CERAMIC, CHIP 0.022uF 10% 25V
C14      1-162-970-11 s CERAMIC, CHIP 0.01uF 10% 25V
C15      1-163-038-00 s CHIP, CERAMIC 0.1uF 25V

C16      1-163-038-00 s CHIP, CERAMIC 0.1uF 25V
C17      1-135-165-11 s TANTALUM, CHIP 33uF 10% 16V
C18      1-104-823-11 s TANTALUM, CHIP 47uF 20% 16V
C19      1-164-350-11 s CERAMIC 470PF 10% 1KV
C20      1-163-243-11 s CERAMIC, CHIP 47PF 5% 50V

C21      1-163-038-00 s CHIP, CERAMIC 0.1uF 25V
C22      1-128-405-11 s ELECT 22uF 20% 50V
C23      1-162-957-11 s CERAMIC 220PF 5% 50V
C24      1-163-809-11 s CERAMIC, CHIP 0.047uF 10% 25V
C25      1-163-038-00 s CHIP, CERAMIC 0.1uF 25V

C26      1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V
C27      1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V
C28      1-107-689-21 s TANTAL 1uF 20% 35V
C29      1-164-232-11 s CERAMIC, CHIP 0.01uF 10% 50V
C30      1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V

C31      1-135-091-91 s CHIP, TANTALUM 1uF 20% 16V
C32      1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V
C33      1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V
C35      1-163-038-00 s CHIP, CERAMIC 0.1uF 25V
C36      1-162-957-11 s CERAMIC 220PF 5% 50V

C37      1-128-397-21 s ELECT 100uF 20% 16V
C38      1-128-394-11 s ELECT 220uF 20% 10V
C39      1-164-156-11 s CERAMIC 0.1uF 25V
C40      1-107-689-21 s TANTAL 1uF 20% 35V
C41      1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V

C42      1-163-038-00 s CHIP, CERAMIC 0.1uF 25V
C43      1-162-969-11 s CERAMIC 0.0068uF 10% 25V
C44      1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V
C45      1-104-547-11 s FILM 0.0047uF 5% 16V
C46      1-164-227-11 s CERAMIC 0.022uF 10% 25V

C47      1-107-689-21 s TANTAL 1uF 20% 35V
C48      1-163-017-00 s CERAMIC 0.0047uF 10% 50V
C49      1-104-912-11 s CHIP,TANTALUM 3.3uF 20% 16V
C50      1-164-156-11 s CERAMIC 0.1uF 25V
C51      1-135-159-21 s TANTALUM, CHIP 10uF 10% 20V

C52      1-164-156-11 s CERAMIC 0.1uF 25V
C53      1-164-156-11 s CERAMIC 0.1uF 25V
C54      1-162-927-11 s CERAMIC, CHIP 100PF 5% 50V
C55      1-164-156-11 s CERAMIC 0.1uF 25V

CN1      1-580-538-11 o PIN, CONNECTOR (PC BOARD) 18P
CN2      1-764-080-21 s PIN, CONNECTOR (PC BOARD) 8P
CN3      1-569-529-21 o HOUSING, 14P
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(VF-60 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
CN4	1-564-004-11	o	PIN, CONNECTOR 5P
CN5	1-506-470-11	s	PIN, CONNECTOR 5P
D1	8-719-404-35	s	DIODE MA141WK
D2	8-719-900-95	s	DIODE V09G
D3	8-719-820-41	s	DIODE 1SS302
D4	8-719-901-19	s	DIODE V11N
D5	8-719-900-95	s	DIODE V09G
D6	8-719-404-35	s	DIODE MA141WK
D7	8-719-404-35	s	DIODE MA141WK
D8	8-719-029-68	s	DIODE RD6.2UJN-T1
D9	8-719-820-41	s	DIODE 1SS302
D10	8-719-404-35	s	DIODE MA141WK
D11	8-719-404-35	s	DIODE MA141WK
D12	8-719-989-53	s	DIODE CL-200HR-C-TSL
DL1	1-411-383-11	s	DELAY LINE 80 nS
IC1	⚠ 8-759-300-28	s	IC HA11423MP
IC2	8-759-100-94	s	IC UPC358G2
IC3	8-759-209-57	s	IC TC4S69F
IC4	8-759-209-54	s	IC TC4S01F
L2	⚠ 1-459-899-11	s	COIL, HORIZONTAL LINEARITY
L3	1-410-380-31	s	INDUCTOR CHIP 8.2uH
Q1	8-729-028-91	s	TRANSISTOR DTA144EUA-T106
Q2	8-729-028-91	s	TRANSISTOR DTA144EUA-T106
Q3	8-729-117-32	s	TRANSISTOR 2SC4177
Q4	8-729-117-16	s	TRANSISTOR 2SA1611-M6
Q5	8-729-403-29	s	TRANSISTOR XN6435
Q6	8-729-024-56	s	TRANSISTOR 2SA1808
Q7	8-729-422-44	s	TRANSISTOR 2SK663
Q8	8-729-403-32	s	TRANSISTOR XN6534
Q9	8-729-105-37	s	TRANSISTOR 2SC3360-N16
Q10	8-729-105-37	s	TRANSISTOR 2SC3360-N16
Q11	8-729-117-32	s	TRANSISTOR 2SC4177
Q12	8-729-117-16	s	TRANSISTOR 2SA1611-M6
Q13	8-729-141-48	s	TRANSISTOR 2SB624-BV345
Q14	8-729-119-00	s	TRANSISTOR 2SK612
Q15	8-729-119-00	s	TRANSISTOR 2SK612
Q16	8-729-028-91	s	TRANSISTOR DTA144EUA-T106
Q17	8-729-117-32	s	TRANSISTOR 2SC4177
Q18	8-729-117-16	s	TRANSISTOR 2SA1611-M6
Q19	8-729-117-32	s	TRANSISTOR 2SC4177
Q20	8-729-117-32	s	TRANSISTOR 2SC4177
Q21	8-729-117-16	s	TRANSISTOR 2SA1611-M6
Q22	8-729-422-12	s	TRANSISTOR 2SK664
R1	1-216-671-11	s	CHIP, METAL 6.8K 0.50% 1/10W
R2	1-216-309-00	s	CHIP, METAL 5.6 5% 1/10W
R3	1-216-627-11	s	CHIP, METAL 100 0.50% 1/10W
R4	1-208-806-11	s	CHIP, METAL 10K 0.50% 1/10W
R5	1-216-667-11	s	METAL, CHIP 4.7K 0.5% 1/10W
R6	1-208-774-11	s	CHIP, METAL 470 0.50% 1/10W
R7	1-208-806-11	s	CHIP, METAL 10K 0.50% 1/10W
R8	1-218-704-11	s	METAL 3.3K 0.50% 1/16W
R9	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R10	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R11	1-218-680-11	s	METAL 330 0.50% 1/16W
R12	1-216-611-11	s	CHIP, METAL 22 0.50% 1/10W
R13	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W

(VF-60 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R14	1-216-133-00	s	CHIP, METAL 3.3M 5% 1/10W
R15	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W
R16	1-208-774-11	s	CHIP, METAL 470 0.50% 1/10W
R17	1-218-668-11	s	CHIP, METAL 100 0.50% 1/16W
R18	1-216-666-11	s	METAL, CHIP 4.3K 0.5% 1/10W
R19	1-218-680-11	s	METAL 330 0.50% 1/16W
R20	1-218-700-11	s	METAL 2.2K 0.50% 1/16W
R21	1-218-700-11	s	METAL 2.2K 0.50% 1/16W
R22	1-216-639-11	s	METAL, CHIP 330 0.5% 1/10W
R23	1-218-724-11	s	CHIP, METAL 22K 5% 1/16W
R24	1-208-806-11	s	CHIP, METAL 10K 0.50% 1/10W
R25	1-208-814-11	s	CHIP, METAL 22K 0.50% 1/10W
R26	1-216-133-00	s	CHIP, METAL 3.3M 5% 1/10W
R27	1-216-673-11	s	METAL, CHIP 8.2K 0.5% 1/10W
R28	1-216-619-11	s	CHIP, METAL 47 0.50% 1/10W
R29	1-208-812-11	s	CHIP, METAL 18K 0.50% 1/10W
R30	1-208-824-11	s	CHIP, METAL 56K 0.50% 1/10W
R31	1-218-708-11	s	METAL 4.7K 0.50% 1/16W
R32	1-216-133-00	s	CHIP, METAL 3.3M 5% 1/10W
R33	1-216-655-11	s	CHIP, METAL 1.5K 0.50% 1/10W
R34	1-208-800-11	s	CHIP, METAL 5.6K 0.50% 1/10W
R35	1-218-698-11	s	METAL 1.8K 0.50% 1/16W
R36	1-216-687-11	s	METAL, CHIP 33K 0.5% 1/10W
R37	1-208-806-11	s	CHIP, METAL 10K 0.50% 1/10W
R38	1-218-714-11	s	METAL 8.2K 0.50% 1/16W
R39	1-216-633-11	s	CHIP, METAL 180 0.50% 1/10W
R40	1-208-822-11	s	CHIP, METAL 47K 0.50% 1/10W
R41	1-216-609-11	s	CHIP, METAL 18 0.50% 1/10W
R42	1-218-724-11	s	CHIP, METAL 22K 5% 1/16W
R43	1-216-667-11	s	METAL, CHIP 4.7K 0.5% 1/10W
R44	1-208-814-11	s	CHIP, METAL 22K 0.50% 1/10W
R45	1-218-740-11	s	METAL 100K 0.50% 1/16W
R46	1-216-673-11	s	METAL, CHIP 8.2K 0.5% 1/10W
R47	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R48	1-218-899-11	s	CHIP, METAL 150K 0.50% 1/16W
R49	1-216-655-11	s	CHIP, METAL 1.5K 0.50% 1/10W
R50	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R51	1-208-812-11	s	CHIP, METAL 18K 0.50% 1/10W
R52	1-208-814-11	s	CHIP, METAL 22K 0.50% 1/10W
R53	1-218-708-11	s	METAL 4.7K 0.50% 1/16W
R54	1-216-667-11	s	METAL, CHIP 4.7K 0.5% 1/10W
R55	1-216-699-11	s	CHIP, METAL 100K 0.50% 1/10W
R56	1-216-133-00	s	CHIP, METAL 3.3M 5% 1/10W
R57	1-216-133-00	s	CHIP, METAL 3.3M 5% 1/10W
R58	1-208-854-11	s	CHIP,METAL 1M 0.50% 1/10W
R59	1-208-806-11	s	CHIP, METAL 10K 0.50% 1/10W
R60	1-216-699-11	s	CHIP, METAL 100K 0.50% 1/10W
R61	1-216-133-00	s	CHIP, METAL 3.3M 5% 1/10W
R62	1-218-716-11	s	METAL 10K 0.50% 1/16W
R63	1-216-677-11	s	METAL, CHIP 12K 0.5% 1/10W
R64	1-218-768-11	s	METAL 470K 0.50% 1/10W
R65	1-216-685-11	s	METAL, CHIP 27K 0.5% 1/10W
R66	1-216-687-11	s	METAL, CHIP 33K 0.5% 1/10W
R67	1-216-663-11	s	METAL, CHIP 3.3K 0.5% 1/10W
R68	1-218-648-11	s	METAL 15 0.50% 1/16W
R69	1-216-663-11	s	METAL, CHIP 3.3K 0.5% 1/10W
R70	1-218-692-11	s	CHIP, METAL 1K 0.50% 1/16W
R71	1-216-673-11	s	METAL, CHIP 8.2K 0.5% 1/10W
R72	1-216-627-11	s	CHIP, METAL 100 0.50% 1/10W

(VF-60 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R73	1-216-629-11	s	CHIP, METAL 120 0.50% 1/10W
R74	⚠ 1-218-883-11	s	METAL 33K 0.50% 1/16W
R75	1-218-708-11	s	METAL 4.7K 0.50% 1/16W
R76	1-218-716-11	s	METAL 10K 0.50% 1/16W
R77	1-208-814-11	s	CHIP, METAL 22K 0.50% 1/10W
R78	1-218-873-11	s	CHIP, METAL 12K 0.50% 1/16W
R80	1-216-295-11	s	CHIP, CONDUCTOR 0
R81	1-218-716-11	s	METAL 10K 0.50% 1/16W
R82	1-216-793-11	s	METAL 4.7 5% 1/16W
R83	1-218-716-11	s	METAL 10K 0.50% 1/16W
R84	1-218-773-11	s	CHIP, METAL 750K 0.50% 1/10W
R85	1-218-841-11	s	CHIP, METAL 560 0.50% 1/16W
R86	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W
R87	1-218-732-11	s	METAL 47K 0.50% 1/16W
R88	1-218-736-11	s	METAL 68K 0.50% 1/16W
R89	1-218-732-11	s	METAL 47K 0.50% 1/16W
R90	1-218-714-11	s	METAL 8.2K 0.50% 1/16W
R91	1-218-692-11	s	CHIP, METAL 1K 0.50% 1/16W
R92	1-218-883-11	s	METAL 33K 0.50% 1/16W
R93	1-218-867-11	s	CHIP, METAL 6.8K 0.50% 1/16W
R94	1-211-969-11	s	CHIP, METAL 10 0.50% 1/16W
R95	1-218-740-11	s	METAL 100K 0.50% 1/16W
R96	⚠ 1-218-700-11	s	METAL 2.2K 0.50% 1/16W
R97	1-218-710-11	s	CHIP, METAL 5.6K 0.50% 1/16W
R98	1-218-740-11	s	METAL 100K 0.50% 1/16W
R99	1-218-684-11	s	CHIP, METAL 470 0.50% 1/16W
R100	1-218-684-11	s	CHIP, METAL 470 0.50% 1/16W
R101	1-208-822-11	s	CHIP, METAL 47K 0.50% 1/10W
R102	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W
R103	1-218-752-11	s	METAL 330K 0.50% 1/16W
R104	1-218-730-11	s	CHIP, METAL 39K 0.50% 1/16W
R105	1-218-883-11	s	METAL 33K 0.50% 1/16W
R106	1-218-716-11	s	METAL 10K 0.50% 1/16W
RV1	1-241-832-21	s	RES, ADJ, METAL 5K
RV2	1-241-829-21	s	RES, ADJ, METAL 1K
RV3	1-241-832-21	s	RES, ADJ, METAL 5K
RV4	1-241-838-11	s	RES, ADJ, METAL 500K
RV5	1-241-832-21	s	RES, ADJ, METAL 5K
RV6	1-241-828-21	s	RES, ADJ, METAL 500
RV7	1-241-828-21	s	RES, ADJ, METAL 500
RV8	1-241-825-11	s	RES, ADJ, METAL 50
RV9	1-241-741-11	s	RES, ADJ METAL 50K
RV10	1-241-828-21	s	RES, ADJ, METAL 500
S1	1-762-488-11	s	SWITCH, TOGGLE
S2	1-762-020-11	s	SWITCH, TOGGLE
S3	1-762-489-11	s	SWITCH, TOGGLE
T1	⚠ 1-439-419-12	s	TRANSFORMER, FLYBACK
VDR1	1-806-497-00	s	VARISTOR ERZ-C05DK220

VR-199 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8269-388-A	o	MOUNTED CIRCUIT BOARD, VR-199
1pc	3-692-151-01	o	PLATE,GROUND
C1	1-104-823-11	s	TANTALUM, CHIP 47uF 20% 16V
C2	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C3	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C4	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C5	1-107-686-11	s	CHIP, TANTALUM 4.7uF 20% 16V
C6	1-135-160-21	s	CHIP, TANTALUM 15uF 10% 16V
C7	1-163-038-00	s	CHIP, CERAMIC 0.1uF 25V
C8	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
CN11	1-569-529-21	o	HOUSING, 14P
D1	8-719-989-53	s	DIODE CL-200HR-C-TSL
D2	8-719-989-53	s	DIODE CL-200HR-C-TSL
IC1	8-759-939-53	s	IC BA225F-T2
Q1	8-729-028-91	s	TRANSISTOR DTA144EUA-T106
Q2	8-729-028-91	s	TRANSISTOR DTA144EUA-T106
Q3	8-729-402-19	s	TRANSISTOR XN6501
Q4	8-729-402-19	s	TRANSISTOR XN6501
R1	1-216-615-11	s	METAL 33 0.50% 1/10W
R2	1-216-645-11	s	METAL 560 0.50% 1/10W
R3	1-216-673-11	s	METAL, CHIP 8.2K 0.5% 1/10W
R4	1-208-814-11	s	CHIP, METAL 22K 0.50% 1/10W
R5	1-208-814-11	s	CHIP, METAL 22K 0.50% 1/10W
R6	1-208-814-11	s	CHIP, METAL 22K 0.50% 1/10W
R7	1-218-772-11	s	METAL 680K 0.50% 1/10W
R8	1-208-822-11	s	CHIP, METAL 47K 0.50% 1/10W
R9	1-208-824-11	s	CHIP, METAL 56K 0.50% 1/10W
R10	1-216-295-11	s	CHIP, CONDUCTOR 0
R11	1-208-822-11	s	CHIP, METAL 47K 0.50% 1/10W
R13	1-208-814-11	s	CHIP, METAL 22K 0.50% 1/10W
R14	1-208-774-11	s	CHIP, METAL 470 0.50% 1/10W
R15	1-208-822-11	s	CHIP, METAL 47K 0.50% 1/10W
R16	1-216-645-11	s	METAL 560 0.50% 1/10W
RV1	1-238-293-11	s	CARBON, VAR 10K
RV2	1-238-290-11	s	CARBON, VAR 1K
RV3	1-238-296-11	s	CARBON, VAR 10K

```
-----
FRAME
-----
Ref. No.
or Q'ty  Part No.    SP Description

       ⚠ 1-251-386-11 s CRT ASSY, 1.5"
         1-775-771-11 o FLEXIBLE CARD WIRE (14 CORE)
                                (VF-60 TO VR-199)

CN101    1-952-420-21 s HARNESS (VF CABLE3)

CN1F(to VF-60 BOARD)
         1-580-585-11 o HOUSING, 18P
         1-580-599-11 o CONTACT, FEMALE AWG26-30
CN2F(to VF-60 BOARD)
         1-764-196-11 o HOUSING, 8P
         1-695-215-11 o CONTACT, FEMALE AWG26-30
CN21F(to LP-84 BOARD)
         1-569-619-11 o HOUSING, CONNECTOR 4P
         1-565-977-11 s CONTACT, FEMALE AWG 28-32
CN31F(to LP-85 BOARD)
         1-569-619-11 o HOUSING, CONNECTOR 4P
         1-565-977-11 s CONTACT, FEMALE AWG 28-32
```

3-4. Supplied Accessories

```
Ref. No.
or Q'ty  Part No.    SP Description

1pc      1-542-233-12 o MICROPHONE
1pc      3-179-882-01 o SPACER, MICROPHONE
```

3-5. Optional Fixtures

```
Part No.    SP Description

J-6026-100-A o RESOLUTION CHART
J-6395-040-A o EXTENSION BOARD, EX-464
J-6395-050-A o VF EXTENSION HARNESS
```

Section 4
Semiconductor Pin Assignments

ここに記載されている半導体は，それぞれの機能を等価的に表したものです。　なお，互換性のない型名を併記していることがありますので，部品を交換するときは，Spare Partsの章を参照してください。
等価回路はＩＣメーカーのデータブックに従いました。

Semiconductors of which functions are equivalent are described here. For parts replacement, refer to the section of Spare Parts in this manual. The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

Diode	PAGE
1SS302	4-2
CL-150D-CD	4-2
CL-150PG-CD	4-2
CL-150UR-CD	4-2
CL-200HR	4-2
MA141WK	4-2
RD ? ?UJN	4-2
V09C	4-2
V11 ?	4-2

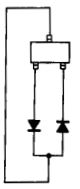
Transistor	PAGE
2SA1611	4-2
2SA1808	4-2
2SB624	4-2
2SC3360	4-2
2SC4177-L6	4-2
DTA144EUA	4-2

Others	PAGE
2SK612	4-2
2SK663	4-2
2SK664	4-2
XN6435	4-2
XN6501	4-2
XN6534	4-2

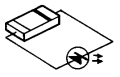
IC	PAGE
BA10358F	4-3
BA225F	4-3
HA11423MP	4-3
TC4S01F	4-3
TC4S69F	4-3

DIODE

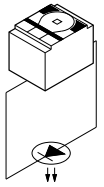
TOP VIEW



1SS302

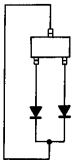


CL-150D-CD;ORANGE
CL-150PG-CD;GREEN
CL-150UR-CD;RED



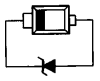
CL-200HR;RED

TOP VIEW



MA141WK

TOP VIEW

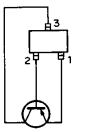


RD ? ?UJN

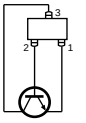
V09C
V11 ?

TRANSISTOR

TOP VIEW

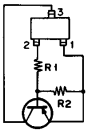


2SA1611
2SA1808
2SB624



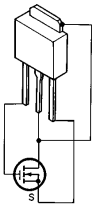
2SC3360
2SC4177-L6

TOP VIEW (SCALE 4/1)



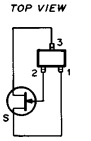
DTA144EUA(R1=47K, R2=47K)

Others

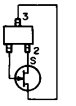


2SK612

TOP VIEW

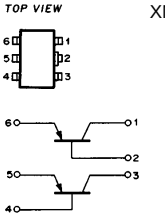


2SK663



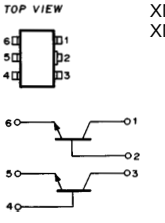
2SK664

TOP VIEW



XN6435

TOP VIEW



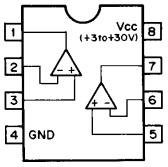
XN6501
XN6534

http://getMANUAL.com

IC

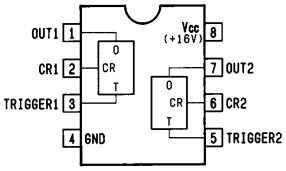
BA10358F(ROHM)FLAT PACKAGE

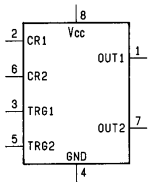
DUAL OPERATIONAL AMPLIFIERS
– TOP VIEW –



BA225F(ROHM)

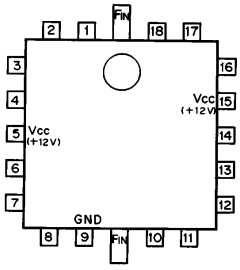
CR TIMER
– TOP VIEW –

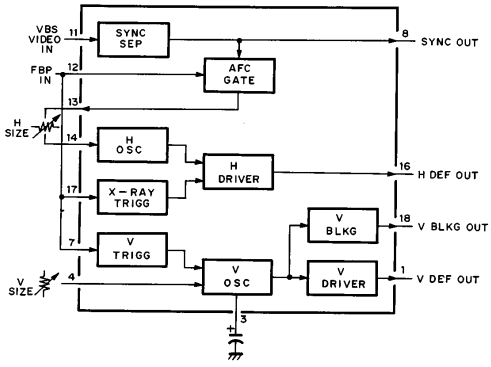




HA11423MP(HITACHI)FLAT PACKAGE

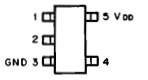
TV H/V SYNC SIGNAL PROCESSOR
– TOP VIEW –

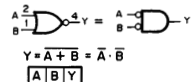




TC4S01F(TOSHIBA)CHIP PACKAGE

C-MOS 2-INPUT NOR GATE
– TOP VIEW –





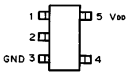
A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

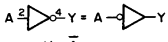
0 ; LOW LEVEL
1 ; HIGH LEVEL

TYPE	VDD
4S01F	+ 3 to + 18V
7S02F	+ 2 to + 6V
7S02FU	
7SH02FU	

TC4S69F(TOSHIBA)CHIP PACKAGE

C-MOS INVERTER
– TOP VIEW –





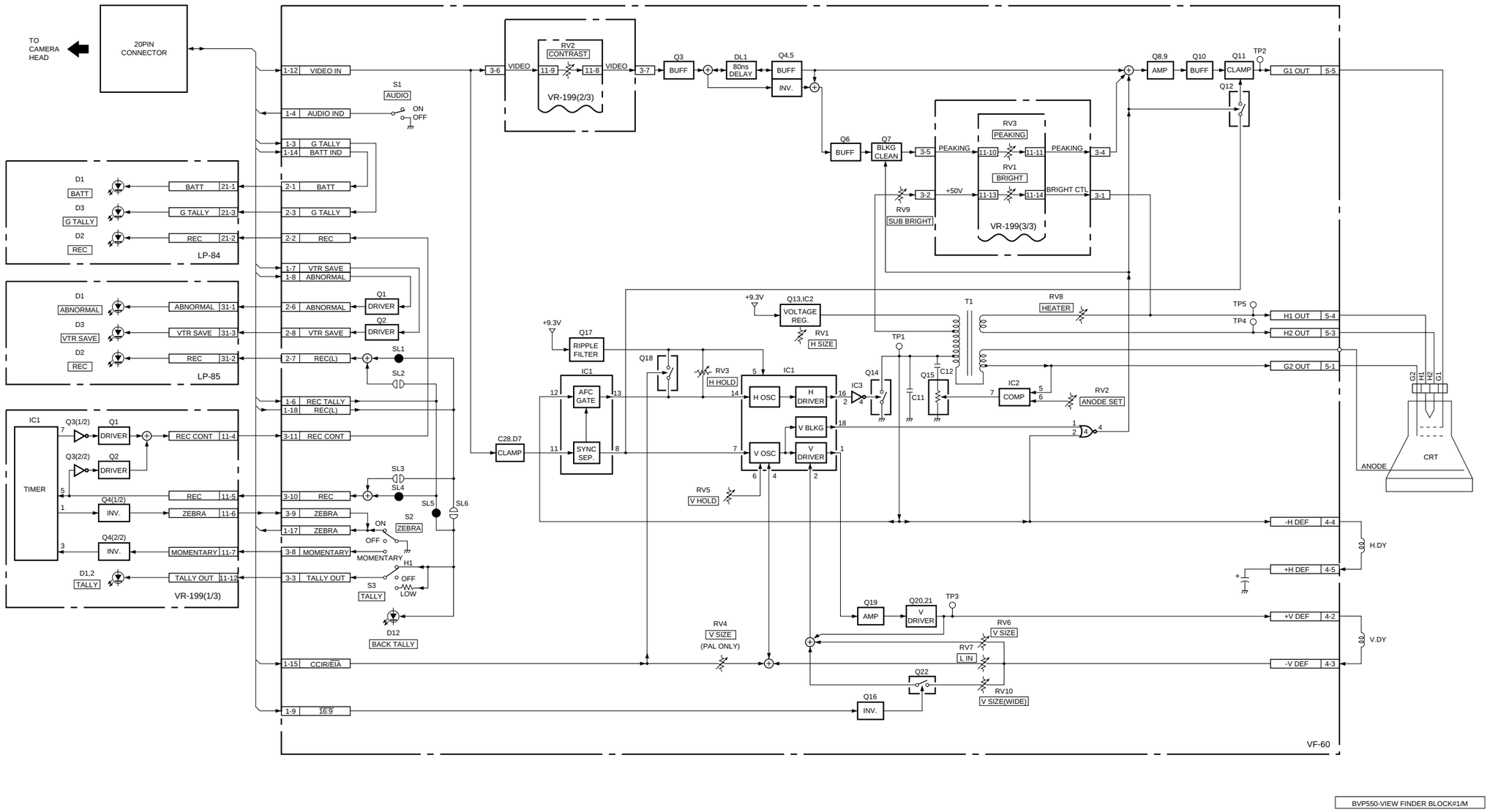
A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

TYPE	VDD
7S04F 7SU04F	+ 2 to + 6V
4S69F 4SU69F	+ 3 to + 18V
7SH04FU	+ 2 to + 5.5V

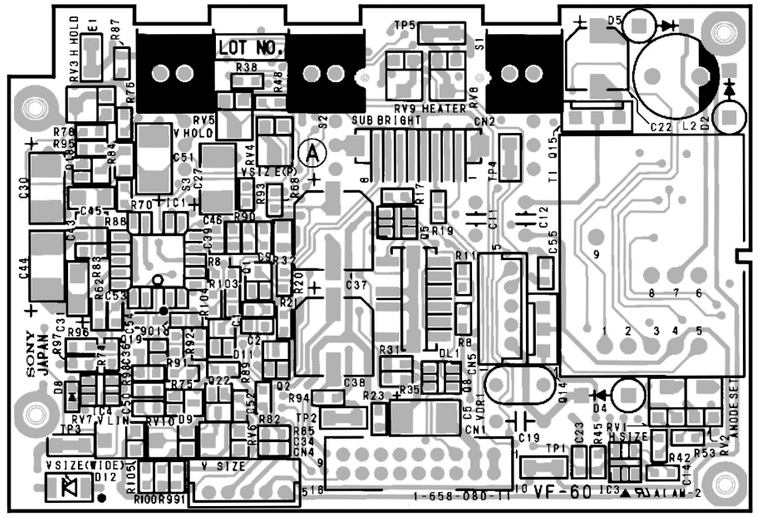
Section 5
Diagrams and Board Layouts

VF BLOCK



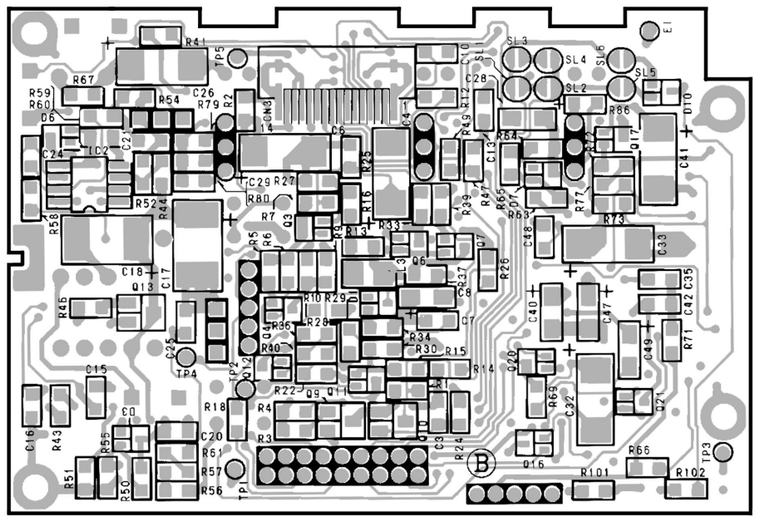
VF BLOCK
BVF-10
BVF-10CE

VF-60 BOARD



VF-60 - A SIDE -

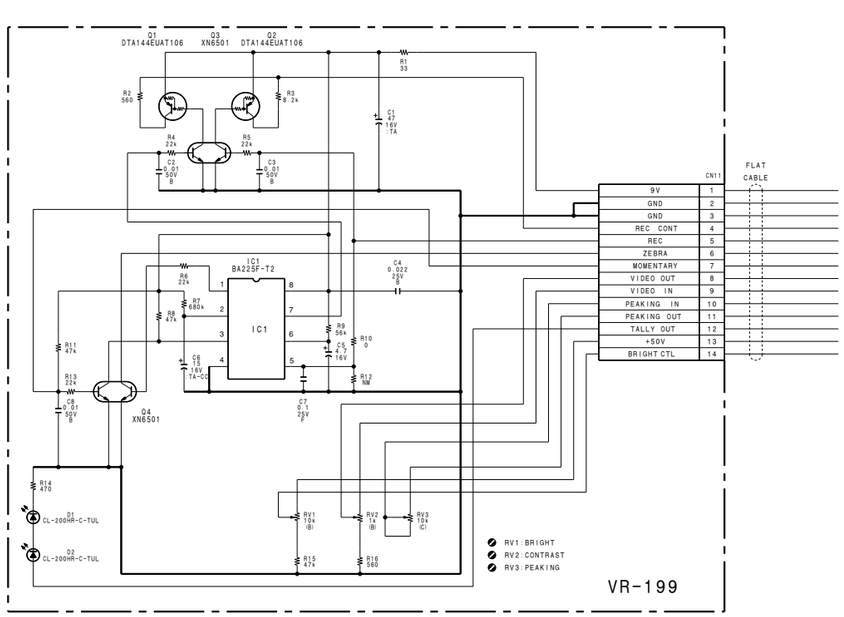
1-658-080-11

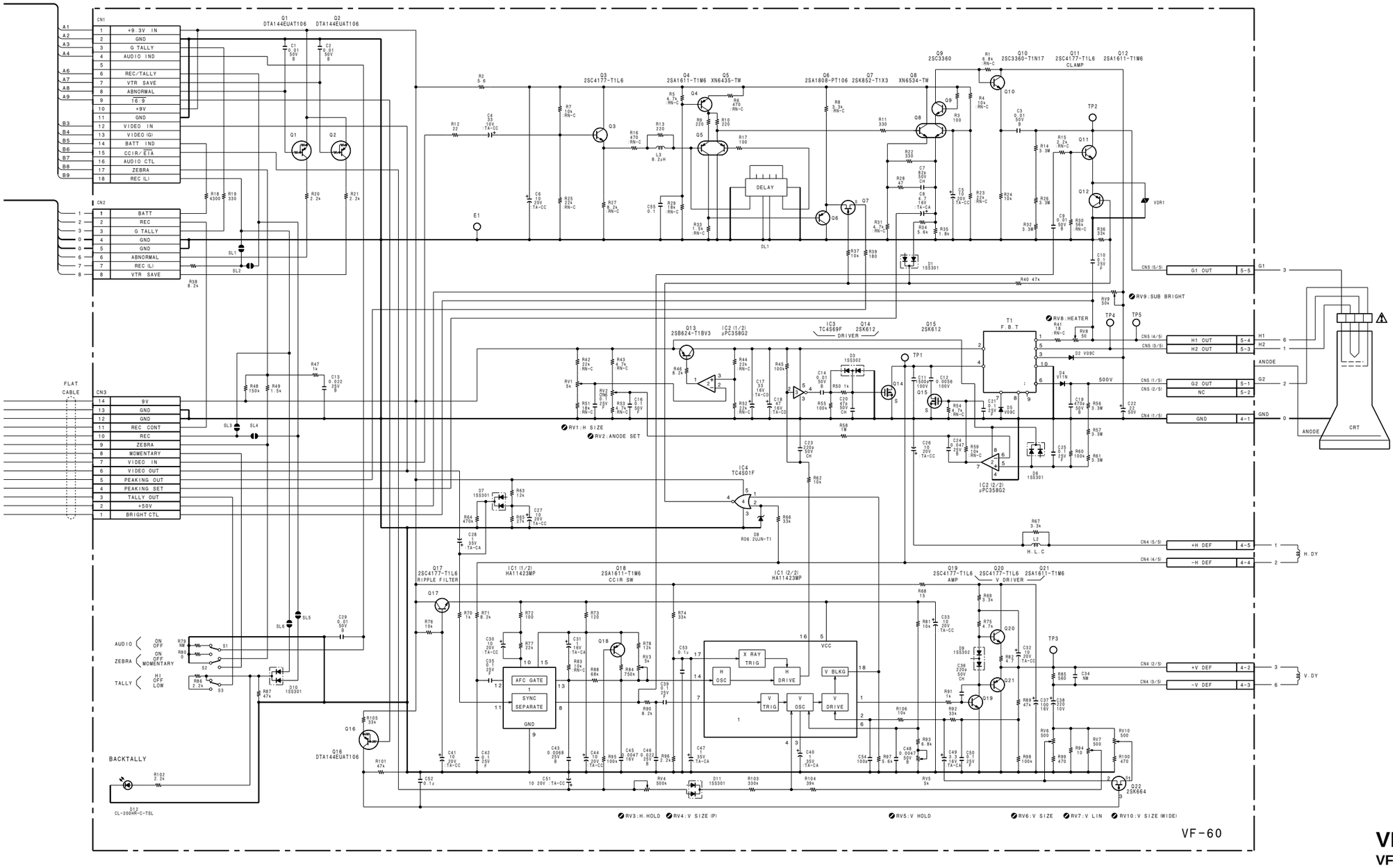


VF-60 - B SIDE -

1-658-080-11

VIEW FINDER





VIEW FINDER

VF-60
VR-199
LP-84/85

A-¥BVP550-VIEW FINDER/M
B-¥BVP550-LP84/M
B-¥BVP550-LP85/M
B-¥BVP550-VF60/M
B-¥BVP550-VR199/M

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BVF-10CE (CE) J, E
3-190-295-01

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Broadcast Products Company

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